

The opinion in support of the decision being entered today  
is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* DANIEL CHIEN, MARTIN PEAKER, DAVID CHAN,  
GARRY BRERETON, PETER KERSLAKE GIBBENS, PAUL ROBERTS,  
PAUL ANTHONY THOMAS and  
JONATHAN LESLIE CHRISTOPHER JACKSON

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Appeal 2007-0550  
Application 10/763,714  
Technology Center 3600

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Decided: September 26, 2007

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Before TERRY J. OWENS, MURRIEL E. CRAWFORD, and  
JENNIFER D. BAHR, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Daniel Chien et al. (Appellants) appeal under 35 U.S.C. § 134 from  
the Examiner's decision rejecting claims 1, 4, 6-8, 11-15 and 17-24, the only

pending claims. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

### THE INVENTION

Appellants' claimed invention is directed to a trailer wheel assembly including an inboard brake (Specification 1). Claim 1 is representative of the claimed invention and reads as follows:

1. An axle assembly for a vehicle comprising:
  - an axle shaft having a first end and a second end, said axle shaft mounted for rotation within a housing, said first end and said second end extending outside of said housing;
  - a hub fixed to said first end of said axle shaft; and
  - a brake assembly including a rotor disposed outside of said housing and attached to said axle shaft adjacent said second end, wherein said second end is spaced apart from said hub a first length greater than an axial length of said housing.

### THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Anderson	US 4,583,609	Apr. 22, 1986
Inoue	US 2002/0028721 A1	Mar. 07, 2002
Seki	US 2003/0136613 A1	Jul. 24, 2003
Attinger (as translated) <sup>1</sup>	CH 663 387 A5	Dec. 15, 1987

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<sup>1</sup> While we, like Appellants (Appeal Br. 5-6), find it difficult to understand why the Examiner waited until mailing of the first Answer (mailed March 2, 2006, superseded by the Answer mailed July 11, 2006) to provide a

The following rejections are before us for review.

Claims 1, 4, 6, 13, 14, 19-21, 23 and 24 stand rejected under 35 U.S.C. § 102(b) as anticipated by Attinger.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Attinger in view of Anderson.

Claims 8, 15 and 17 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Attinger in view of Inoue.

Claims 11, 12, 18 and 22 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Attinger in view of Seki.

The Examiner provides reasoning in support of the rejections in the Final Rejection (mailed December 30, 2004) and Answer (mailed July 11, 2006). Appellants present opposing arguments in the Appeal Brief (filed August 31, 2005) and Reply Brief (filed September 11, 2006).

## FACTS

Our findings with respect to Attinger are as follows:

Attinger transmits motion from a motor (not shown) to wheel-set shaft 3 via a transmission arranged in transmission housing 5. The transmission surrounds the wheel-set shaft 3 and transmits motion to hollow shaft 7, which transmits motion to a second hollow shaft 9 via shaft coupling 8, hollow shaft 9 in turn transmitting motion to wheel-set shaft 3 via another

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translation of Attinger, a reference relied on by the Examiner in rejecting claims in both the first Office Action (mailed September 8, 2004) and the Final Rejection (mailed December 30, 2004), we find it equally mystifying that Appellants would incur the expense of preparing and filing responses to the first Office Action and Final Rejection and the expense of preparing and filing an Appeal Brief without themselves obtaining a translation.

shaft coupling 10. (Attinger 4.) Wheels 2 are connected to one another by wheel-set shaft 3, which is pivoted in wheel bearings 4 (Attinger 4).

The brake device comprises a disk brake 11 arranged on hollow shaft 7 and brake shoes 12 of a disk-brake caliper 14 acting upon the disk brake 11. The disk-brake caliper is rigidly connected via a carrier cantilever 15 to transmission housing 5 and has fixed thereon a brake cylinder 16 for activating disk-brake caliper 14. (Attinger 5.) The hollow shafts 7 and 9 are not fixed with respect to one another, "but allow to a limited extent a relative motion of the wheel set shaft" (Attinger 3). With such an arrangement, Attinger achieves a brake arrangement which is not influenced by the motion of the wheel-set shaft, thereby improving the brake effect. *Id.* In other words, neither disk brake 11 nor disk-brake caliper 14 is influenced by the motion of wheel-set shaft 3. *Id.* Consequently, problematic relative motion between these two parts is preferably avoided (Attinger 2).

## DISUSSION

Appellants' position with respect to the rejections has shifted from the Appeal Brief to the Reply Brief, after receiving a copy of the translation of Attinger from the Examiner with the first Answer and learning that hollow shaft 7, hollow shaft 9 and wheel-set shaft 3 are all mounted for rotation, at least to a limited extent (Attinger 3), with respect to one another and with respect to the transmission housing 5. Our decision thus addresses Appellants' position as set forth in the Reply Brief. We do not address Appellants' arguments directed to the "First Interpretation of Attinger" (Reply Br. 3) and "Third Interpretation of Attinger" (Reply Br. 5-6), because we do not adopt the reading of Appellants' claims on Attinger in accordance

with either of these interpretations of Attinger. With respect to the anticipation rejection issue, we thus focus our attention on Appellants' argument under the heading "Second Interpretation of Attinger" (Reply Br. 3-5).

Appellants' argument as to why Attinger does not anticipate claims 1, 4, 6, 13, 14, 19-21, 23 and 24 is that Attinger's wheel-set shaft 3, hollow shaft 7 and hollow shaft 9 are separate from one another and, further, allow a limited extent of relative movement therebetween and thus cannot reasonably be considered an axle shaft as understood by a worker of ordinary skill in the art (Reply Br. 3-4). This argument is not commensurate in scope with the claims, which do not require that the "axle shaft" or "axle" be a single unitary shaft which moves as a single unit. Moreover, even assuming Appellants are correct that one of ordinary skill in the art would not understand the hollow shafts 7, 9, shaft couplings 8, 10 and wheel-set shaft 3 to be an "axle shaft" or "axle" as set forth in independent claims 1, 13 and 19, none of these claims requires the brake assembly or rotor to be fixed or directly mounted to the claimed axle shaft or axle. Claim 1 recites that the brake assembly including a rotor is "attached to said axle shaft adjacent said second end"; claim 13 recites that the "rotor is fixed<sup>[2]</sup> adjacent said second end of said axle shaft" and claim 19 calls for the brake member to be "attached to said second end portion" of the axle. Thus, even if the hollow shaft 7 to which disk brake 11 is attached is not considered part of the claimed "axle shaft" or "axle," the disk brake 11 is still attached to wheel-set shaft 3 adjacent its second (left) end, as called for in claim 1, indirectly via

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<sup>2</sup> The claim does not specify to what the rotor is fixed and, in particular, does not require that the rotor be fixed to the axle shaft.

hollow shafts 7 and 9 and shaft couplings 8 and 10; is fixed (to the hollow shaft 7) adjacent the second (left) end of wheel-set shaft 3, as called for in claim 13; and is attached to the second end portion (the portion to the left of the transmission housing 5) of wheel-set shaft 3, as called for in claim 19, indirectly via hollow shafts 7 and 9 and shaft couplings 8 and 10. Moreover, wheel-set shaft 3 has a wheel 2 hub fixed to a first (right) end thereof. Consequently, the limitations of claims 1, 13 and 19 are met even if the axle shaft or axle is read on Attinger's wheel-set shaft 3 alone.

In light of the above, Appellants' argument does not demonstrate error in the Examiner's rejection of independent claims 1, 13 and 19, and dependent claims 4, 6, 14, 20, 21, 23 and 24, which Appellants do not argue separately from the independent claims, as anticipated by Attinger. The rejection is sustained.

The rejection of claim 7, which depends from claim 1 and further recites that the actuator is hydraulically actuated, as unpatentable over Attinger in view of Anderson is also sustained. Attinger does not expressly specify the actuating fluid used in brake cylinder 16. Anderson, however, evidences that the use of hydraulically actuated disk brakes was known in the art at the time of Appellants' invention (Anderson 2:4). To use any of the well known brake actuating fluids, including hydraulic brake fluid, in the braking system of Attinger would have been obvious to one of ordinary skill in the art at the time of Appellants' invention.

While there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness, "the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and

creative steps that a person of ordinary skill in the art would employ.” *KSR Int’l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007).

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

*Id.*, at 1740, 82 USPQ2d at 1396. We must ask whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* Further,

[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under § 103.

*KSR Int’l.*, 127 S.Ct. at 1742, 82 USPQ2d at 1397.

There are a finite number of conventional brake fluids known for use in disk brake systems. As evidenced by Anderson, hydraulic fluid is one of those identified conventional brake fluids and, as such, its selection appears

to be the product not of innovation but of ordinary skill and common sense and thus does not patentably distinguish claim 7 from Attinger.

We turn our attention next to the rejection of claims 8, 15 and 17 as unpatentable over Attinger in view of Inoue. Appellants do not separately argue these claims. Therefore, in accordance with 37 C.F.R.

§ 41.37(c)(1)(vii), we select claim 8 as the representative claim to decide the appeal of this rejection, with claims 15 and 17 standing or falling with claim 7. The issue involved in the appeal of this rejection is whether Appellants have demonstrated the Examiner erred in determining it would have been obvious to provide the axle shaft of Attinger with bearing assemblies as taught by Inoue for supporting rotation of the axle shaft relative to transmission housing 5 to reduce friction on the axle shaft, reduce local overheating and increase efficiency (Final Rejection 4). Appellants argue that the wheel-set shaft 3 of Attinger is supported by bearings 4 necessarily independent of any bearings within transmission housing 5 and that any modification to Attinger that proposes to support the wheel-set shaft 3 with bearings in transmission housing 5 "would destroy the intended operation of Attinger and is not proper" (Reply Br. 7).

It is not apparent and Appellants do not elaborate on why or how the provision of bearing assemblies within transmission housing 5 would destroy the intended operation of Attinger. While Attinger's wheel-set shaft 3 is pivoted in wheel bearings 4, wheel-set shaft 3 is also supported for rotation, via shaft couplings 8 and 10 and hollow shafts 7 and 9, within transmission housing 5. Appellants do not dispute the Examiner's finding (Final Rejection 4) that the use of bearing assemblies for supporting an axle shaft was known in the art at the time of Appellants' invention, as evidenced



by Inoue. It is apparent that Attinger's hollow shaft 7 is supported for rotation within transmission housing 5, though Attinger does not specify the details of such support arrangement. A person of ordinary skill in the art, being "a person of ordinary creativity, not an automaton" (*KSR Int'l.*, 127 S.Ct. at 1742, 82 USPQ2d at 1397), would have looked to the known techniques, such as bearings, for rotatably supporting a shaft within a housing and would have found it obvious to mount Attinger's hollow shaft 7, which in turn supports hollow shaft 9 and wheel-set shaft 3, for rotation within transmission housing 5. A person of ordinary skill in the art would not have found such modification of Attinger uniquely challenging or beyond his or her skill. Rather, the modification strikes us as simply a predictable use of prior art elements according to their established functions. The rejection of representative claim 8, and claims 15 and 17 standing or falling therewith, is sustained.

Turning finally to the rejection of claims 11, 12, 18 and 22 as unpatentable over Attinger in view of Seki, Appellants do not argue these claims separately. Therefore, in accordance with 37 C.F.R. § 41.37(c)(1)(vii), we select claim 11 as the representative claim to decide the appeal of this rejection, with claims 12, 18 and 22 standing or falling therewith. We note, at the outset, that claim 11 does not require that the housing actually be mounted to a suspension arm; rather, claim 11 simply recites that "said housing is mountable to a suspension arm" (emphasis ours). We find nothing in Attinger, and Appellants have not pointed to anything, that would render transmission housing 5 incapable of being mounted to a suspension arm. Appellants thus fail to persuade us that Attinger does not meet the limitation at issue.

Appellants argue that, since Attinger's transmission housing 5 is mounted to allow movement of the wheel-set shaft 3 relative to transmission housing 5, to mount housing 5 as proposed by the Examiner "is counter to and would essentially destroy the intended operation of Attinger" (Reply Br. 8). Even assuming claim 11 did require actual mounting of the transmission housing to a suspension arm, this argument is not persuasive of error. Specifically, it is not apparent, and Appellants have not cogently explained, how mounting the transmission housing 5 of Attinger to a suspension arm would destroy the intended operation of Attinger. While Attinger seeks to isolate the brake arrangement from the motion of wheel-set shaft 3 (Attinger 3), to avoid relative motion between the two components (disk brake and caliper) of the brake arrangement (Attinger 2), mounting of the transmission housing 5 to a suspension arm would not appear to cause either of the components of the brake arrangement, the disk brake 11 of which is mounted to the hollow shaft 7 and the brake caliper 14 of which is mounted via piston rod 17, carrier cantilever 15 and brake cylinder 16 to transmission housing 5, to be influenced by motion of wheel-set shaft 3. Unless that suspension arm is also mounted to wheel-set shaft 3, Attinger's arrangement of hollow shafts 7, 9 and shaft couplings 8, 10 would appear to afford the isolation desired by Attinger.

For the reasons discussed above, the rejection of claim 11, and claims 12, 18 and 22 standing or falling therewith, is sustained.

SUMMARY

The decision of the Examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2006).

AFFIRMED

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